

ABSTRAK

Peningkatan penggunaan sepeda motor menyebabkan kebutuhan bahan bakar semakin tinggi, sehingga diperlukan penelitian mengenai pengaruh campuran bahan bakar terhadap performa dan efisiensi mesin. Penelitian ini bertujuan untuk mengetahui pengaruh campuran Pertamina RON 92 dengan etanol 5%, 10%, dan 15% terhadap performa sepeda motor dan konsumsi bahan bakar spesifik pada kondisi berkendara normal. Pengujian dilakukan menggunakan *roller dynamometer* pada sepeda motor 156,9 cc dengan metode mencapai kecepatan 80 km/jam dalam waktu 40 detik. Parameter yang dianalisis meliputi *Brake Power*, *Brake Torque*, *Brake Specific Fuel Consumption* (BSFC), *Brake Thermal Efficiency* (BTE), *Brake Mean Effective Pressure* (BMEP), *Air Fuel Ratio* (AFR), dan RPM. Hasil pengujian menunjukkan bahwa campuran etanol 5% dan 15% menghasilkan daya tertinggi sebesar sekitar 1,8 kW. Pada parameter torsi, campuran etanol 10% menghasilkan torsi tertinggi sekitar 13 Nm, sedangkan campuran etanol 5% memiliki kestabilan torsi yang lebih baik. Efisiensi termal tertinggi diperoleh pada campuran etanol 10% dengan nilai sekitar 55%. Sementara itu, campuran etanol 15% menghasilkan nilai BSFC paling rendah dan lebih stabil, sehingga dinilai paling efisien dalam penggunaan bahan bakar pada kondisi berkendara normal. Berdasarkan hasil penelitian, pencampuran etanol pada Pertamina RON 92 berpengaruh terhadap performa mesin dan efisiensi bahan bakar. Campuran etanol 5% lebih baik dalam menjaga performa mesin, etanol 10% menghasilkan efisiensi termal terbaik, sedangkan etanol 15% paling efisien dalam konsumsi bahan bakar.

Kata kunci: Pertamina RON 92, etanol, performa mesin, konsumsi bahan bakar, efisiensi termal, gaya berkendara.

ABSTRACT

The increasing use of motorcycles has led to higher fuel demand, making it necessary to study the effect of fuel mixtures on engine performance and efficiency. This study aims to determine the effect of mixing Pertamina RON 92 with 5%, 10%, and 15% ethanol on motorcycle performance and specific fuel consumption under normal riding conditions. The testing was carried out using a roller dynamometer on a 156.9 cc motorcycle with a method of reaching a speed of 80 km/h within 40 seconds. The parameters analyzed included Brake Power, Brake Torque, Brake Specific Fuel Consumption (BSFC), Brake Thermal Efficiency (BTE), Brake Mean Effective Pressure (BMEP), Air Fuel Ratio (AFR), and RPM. The test results showed that ethanol blends of 5% and 15% produced the highest power output of approximately 1.8 kW. In the torque parameter, the 10% ethanol blend produced the highest torque of approximately 13 Nm, while the 5% ethanol blend demonstrated better torque stability. The highest thermal efficiency was obtained from the 10% ethanol blend with a value of approximately 55%. Meanwhile, the 15% ethanol blend produced the lowest and more stable BSFC value, making it the most efficient in fuel consumption under normal riding conditions. Based on the results of the study, the addition of ethanol to Pertamina RON 92 affects engine performance and fuel efficiency. The 5% ethanol blend was better at maintaining engine performance, the 10% ethanol blend produced the best thermal efficiency, while the 15% ethanol blend was the most efficient in fuel consumption.

Keywords: *Pertamax RON 92, ethanol, engine performance, fuel consumption, thermal efficiency, riding style.*